Personal and Social Influences of Speeding

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Abstract

Speeding has been widely recognized around the world as a major cause of road accidents and fatalities. However, speeding is also one of the most socially acceptable deviant driving behaviors. Using data collected via a survey, this paper examines the effects of the respondents' personality, perception of enforcement and crash risks, attitudes to speeding and the perceived attitudes of the respondents' significant others on the respondents' self-reported speeding behaviors.

Introduction

Traffic accidents are widely recognized as a leading cause of deaths in many countries and speeding is unequivocally accepted as a major cause of road accidents (Lave, 1985; Horswill & McKenna, 1997). In the Australian State of Queensland, for example, speeding was considered to be a major contributing factor in 14% of all fatal crashes, making it one of the top four major contributing factors that are commonly known as the Fatal Four in Australia (Queensland Transport, 2000).

The most common response in many countries to the speeding problem is to impose a legal speed limit on major highways and urban roads. The effects of speed limit laws on road accidents have been well researched and documented (Lave, 1985; McCarthy, 2001). Most of these studies, however, examined the effect of the passage of the legislation on road accidents and only a few studies have investigated the effect of speed limit enforcement on road safety (Hakim and Shefer, 1991). McCarthy (1991, 1993) found a significant relationship between the number of speeding tickets and road safety.

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Ironically, speeding is also regarded as one of the most socially acceptable deviant driving behavior. Roadside surveys conducted in UK revealed that drivers stopped by police for speeding did not see their speeding as potentially harmful, did not consider their speed as criminal and did not feel guilty despite being issued with fines or warnings (Simon and Corbett, 1992). Similar results were also found in the Australian State of Queensland where a third of the respondents surveyed in The Department of Transport's Wave Survey indicated that they did not consider driving at 15 km/h over the speed limit as speeding.

Part of the irony can be interpreted as the causal effect of the social acceptance of speeding on speed related crashes. Since many drivers do not consider speeding to be unacceptable, they are more likely to speed and thus resulting in higher incidences of speed related crashes. Counterbalancing this argument is the observation that even though drink driving is considered to be unacceptable by a larger segment of the driving population in Queensland, it is considered as a major contributor in twice as many fatal crashes.

This paper summarises the results of a survey conducted recently at the Queensland University of Technology on drivers' attitude and perception towards speeding and their self-reported speeding behavior. In addition, we also examine the influences of personality, perceived enforcement activities and perceived attitudes of their significant others on their reported speeding behavior.

The Sample

The sample consists of 145 staff and students of the university, of which about half are first year students in the School of Psychology and Counselling. Staff and students from civil engineering, nursing, psychology and the road safety courses were also recruited for the survey. About 64% of the sample are females and the age distribution are as follows: under 21 (28.3%), 21-25 (11.0%), 26-30 (17.2%), 31-35 (17.2%) and above 35 (26.2%). There appears to be a relatively good spread of respondents with respect to age and sex.

Self-Reported Speeding Behavior

The self-reported speeding behavior of the respondents were measured using 4 items: (a) I often drive greater than 10 km/h over the speed limit on urban roads; (b) I often drive greater than 20 km/h over the speed limit on urban roads; (c) I often drive greater than 10 km/h over the speed limit on open roads/highways; and (d) I often drive greater than 20 km/h over the speed limit in open roads/highways. All items were measured using a 5-point Likert Scale and coded in increasing order from strongly agree (1) to strongly disagree (5).

The mean response and the standard deviation of each of the four items described above were (a) 3.14 and 1.16; (b) 3.97 and 0.93; (c) 2.59 and 1.21; and (d) 3.57 and 1.15. The corresponding shares of respondents who indicated that they often speed (strongly agree/agree) under the 4 scenarios above were (a) 40.7%, (b) 9.7%, (c) 64.2% and (d) 20.0%. These statistics indicate that speeding is quite wide spread

among the respondents and are consistent with the results of the government's survey in Queensland.

To simplify analysis, a composite score using the mean value of the four items was also computed. Lower values of the composite score will indicate more self-reported speeding. The mean and standard deviation of the composite score were 3.32 and 0.86 respectively.

Personality

A number of studies have suggested that speeding is a type of behavior that is likely to be exhibited by individuals who possess the personality trait known as sensation seeking (Jonah, 1997). Sensation seeking propensity has been found to correlate well with many risky driving behavior including speeding, with typical values of the correlation coefficient ranging between 0.3 and 0.4 (Jonah, 1997). Furthermore, sensation seeking propensity has also been found in the literature to relate positively with accident involvement and traffic violations (Jonah, 1997, Quimby et al., 1999).

This study utilized the *Thrill and Adventure Seeking* sub-scale of the *Sensation Seeking Scale* developed by Zuckerman et al. (1978). This sub-scale was found to be the most strongly related to speeding violations (Jonah, 1997). The 10 items in the sub-scale are: (a) I often wish I could be a mountain climber; (b) A sensible person avoids activities that are dangerous; (c) I would like to take up the sport of skiing; (d) I would like to try windsurfing; (e) I would like to learn to fly an aeroplane; (f) I would like to go scuba diving; (g) I would like to try parachute jumping; (h) I would like to dive off the high board; (i) I would like to sail a long distance in a small but seaworthy sailing craft; (k) I think I would enjoy the sensation of skiing very fast down a high mountain.

Although the original scale is based upon a forced choice format, Likert scale format is also used to eliminate the problem of missing data encountered in forced choice format (Rimmo & Arberg, 1999). In this study, these items are measured using a 5-point Likert scale and a composite index is computed using the mean value of the 10 items, with the value for (b) reversed. Lower values for the composite score indicate higher sensation seeking propensity.

The mean score for individual items measuring the sensation seeking propensity ranged from 2.34 for scuba diving to 3.43 for mountain climbing. The composite sensation seeking score had a mean of 2.84 and standard deviation of 0.92 indicating a relatively sensation seeking prone sample albeit with a fair amount of variation within the sample. Seven of the ten items had means scores that were less than the neutral score of 3, indicating that the most respondents in the sample would like to engage in many of the thrill and adventuresome activities, regardless of the physical and social risks involved.

The correlation coefficient between the composite sensation seeking score and the composite speeding behavior score is 0.37 and statistically significant at $\alpha = 0.01$ level. The correlation between the composite sensation seeking score and all the four individual self-reported speeding behaviors are also found to be statistically significant at $\alpha = 0.01$ level and the correlation coefficients ranged from 0.23 to 0.37.

Therefore, the sensation seeking scale appears to be a good predictor of speeding behavior.

Perceived Crash Risks

The primary concerns of most government agencies responsible for road safety around the world are the socially unacceptable high rates of fatal and injury crashes. In an effort to reduce the road trauma, many government agencies, especially those in Australia and New Zealand, have embarked on very expensive public education campaigns to raise the perceive crash risks associated with speeding. These education campaigns often rely on high fear appeals advertising that depict bloody crashes on public television. The perceived susceptibility and severity of threat associated with crashes are important determinants of message acceptance in most fear appeals models (Tay, 1999,2001).

In addition, economic models of decision making hypothesize that a consumer will choose an optimal level of an activity where the marginal cost of consuming that activity is equal to the marginal benefit. In choosing the level of speed, the perceived crash cost will form an important component of the marginal cost of speed selection (McCarthy, 1991,1993). Higher perceived crash costs thus are expected to be associated with lower levels of speeding activity.

The perceived crash risks were measured in this study by 8 items capturing the severity and susceptibility to crashes: (a) The chance of getting into a non-injury accident from speeding is very small; (b) Getting into a non-injury accident would not really bother me; (c) The chance of getting into a injury accident is very small; (d) Getting injured in an accident would not really bother me; (e) Injuring someone else would not really bother me; (f) The chance of getting into a fatal accident is very small; (g) Getting killed in an accident would not really bother me; (h) Killing someone else in an accident would not really bother me. Again, these items were measured using the 5-point Likert scale and a composite score was computed, with lower values indicating lower perceived risks.

The composite score had a very high mean of 4.28 with a standard deviation of 0.61 indicating a uniformly high perceived risk across the sample. It is interesting to note that the mean scores for (e) and (h) are higher than the mean scores for (d) and (g) implying that respondents are, on average, more concerned about injuring or killing someone else than they are of injuring or killing themselves. The percentages of respondents who strongly disagreed with (g) and (h) are very large (80.7% and 86.9%) and the corresponding percentages of respondents who strongly disagreed/disagreed were extremely large (91.7% and 94.3% respectively). In contrast, the percentages of respondents who strongly agreed/agreed with (d) and (e) were extremely small (5.4% and 4.2% respectively).

The correlation coefficient between the composite score for perceived risks and the composite score for speeding is relatively small ($\rho = 0.12$) and statistically insignificant even at $\alpha = 0.10$ level. In addition, the composite perceived risks score is not significantly correlated with any of the four items measuring speeding behavior. These results suggest that either the 8 items used are not a good measure of perceived crash risks or perceived crash risk is not a good predictor of speeding

behavior. The latter explanation is more likely because of the low variation in the responses on perceived crash risks. This result does not imply that perceived crash risks are not important to the respondents. On the contrary, the high mean score indicates otherwise; but it does imply that the uniform across the board responses do not provide sufficient variation to explain the differences observed in speeding behavior.

Enforcement Deterrence

A second common approach taken by many transport and traffic authorities in the world to tackle and reduce the incidences of risky driving is to outlaw such activities. This approach is based on a common theoretical perspective called deterrence theory, which has popular support in both economics (Becker, 1965), social psychology and criminology (Gibbs, 1975). Deterrence theory hypothesized that a driver may be deterred from speeding as a result of the perceived high likelihood of apprehension and punishment.

Enforcement deterrence in this study is measured using 6 items: (a) I often speed and do not get caught by the police; (b) Many people I know often speed and do not get caught by police; (c) The chance of being fine for speeding is very small; (d) Being fine for speeding would not really bother me; (e) The chance of having my license cancelled for speeding is very small; (f) Having my license cancelled for speeding would not really bother me. Again, a composite deterrence score is computed using the mean value, with lower values indicating lower perceived enforcement deterrence.

The mean of the composite score for enforcement deterrence is 3.23 and the standard deviation is 0.59. The composite deterrence score was significantly correlated with the composite speeding score, with an estimated coefficient of 0.25 and is statistically significant at $\alpha = 0.01$ level. It is also significantly correlated with three of the four self-reported speeding behaviors. The one behavior that it does not predict as well is driving at 10 km/h over the speed limit on open roads/highway. This outcome may be a result of a common perception that the police are less likely to apprehend drivers for driving at 10 km/h over the speed limit when the limit is 100/110 km/h.

Personal Attitudes

In social psychology, the attitudes of the respondents and those of their significant others, such as friends and family, are also important determinants of behavioral intentions, which in turn is a significant determinant of actual behavior. Both the Theory of Reasoned Action and the Theory of Planned Behavior posit that respondents who have more positive attitudes towards speeding will tend to speed more often (Ajzen and Feshbech, 1980).

Personal attitudes toward speeding were measured by 4 items: (a) I believe fines for speeding are mainly intended to raise revenue; (b) I don't consider driving less than 10 km/h above the speed limit as speeding; (c) I don't consider driving less than 20 km/h above the speed limit as speeding; (d) I believe it's okay to exceed the

speed limit if you are driving safely. These items were all measured using a 5-point Likert scale. Again, a composite score was computed using the mean value of the 4 items.

The mean composite score for personal attitudes was estimated at 3.16, with a standard deviation of 0.81. It correlated very well with the composite score for speeding behavior, with a correlation coefficient of 0.40 and was statistically significant at $\alpha = 0.01$ level. It also correlated very well with all 4 items measuring speeding behavior, with correlation coefficients ranging from 0.29 to 0.41 and statistically significant at $\alpha = 0.01$ level. These results implied that personal attitudes toward speeding were good predictors of speeding behavior.

Subjective Norms

Subjective norms in social psychology include beliefs about the attitudes of the respondents significant others regarding the behavior of interest (Ajzen and Feshbech, 1980). The same set of items that were used to measure personal attitudes were also used to measure the respondents' beliefs about the attitudes of their friends and family. A composite score was also computed in a similar way. The estimated mean value of the subjective norm score was 3.05 and the corresponding standard deviation was 0.66.

The composite subjective norms score was found to correlate very well with the composite score for the self-reported speeding behavior. The estimated correlation coefficient was 0.22 and was statistically significant at $\alpha = 0.01$ level. However, it was found to be significantly correlated with only the more excessive (20 km/h over the speed limit) speeding behavior and not with driving greater than 10 km/h over the speed limit on both the urban and open roads.

Multivariate Analysis

The univariate analyses conducted above revealed that four of the five sets of influences were, individually, good predictors of self-reported speeding behavior. It would be interesting also to discover how well these influences, as a whole, predicted speeding behavior. An ordinary least squares regression model was estimated using the composite score for speeding as the dependent variable and the composite scores of the five sets of influences as the independent variables.

Overall, the model fitted the data quite well, with an R-square of 0.58 and an F-statistic of 14.24. The estimated coefficients and the corresponding t-statistics are shown in Table 1. Similar to the univariate analyses, the same four of the five influences were also found to be statistically significant in the multivariate analysis. The strongest predictor, by the size of both the estimated coefficient and the t-statistic, was the personal attitudes of the driver towards speeding. It also had the highest standardized beta coefficient. This influence was followed by the sensation-seeking propensity of the driver, which had the second highest standardized beta coefficient.

Table 1: Estimation Results

Variables	Coefficients	t-statistics
Constant ***	1.432	2.89
Sensation Seeking ***	0.286	4.25
Perceived Crash Risks	-0.010	-0.90
(Un)Enforcement *	0.195	1.76
Personal Attitudes ***	0.634	5.71
Subjective Norms ***	-0.379	-2.82

Note: * & *** denote statistically significant at $\alpha = 0.10$ & 0.01 levels respectively.

The third most significant influence was the subjective norms or the perceived beliefs of the respondents' significant others. However, the estimated coefficient for this factor was negative instead of positive as expected. The major influence of subjective norms is in shaping the personal attitudes of drivers, which accounts for the very high correlation coefficient of 0.74 between these two sets of attitudes. Holding personal attitudes of the driver constant (as another regressor in the model), a more conforming subjective norms may have acted as an inducement for these young and high sensation-seeking drivers to act rebelliously in search of more thrill.

The last significant influence, albeit only at $\alpha = 0.10$ level, was the perceived negative attitudes towards traffic enforcement. This result implied that enforcement activities could, to a certain extent, deter drivers from speeding. Although this result was not as strong as most road safety authorities would like, it was not surprising given that the sample consisted of relatively high sensation-seeking drivers. The expected benefits from speeding for these drivers were higher than normal, and as a result, the relative deterrence effects of enforcement and perceived crash risks would be lower.

Concluding Remarks

Overall it appears that personality, attitudes and social norms play a significant role in self-reported speeding. In contrast, enforcement deterrence appears to play a minor role and perceived crash risks seems to have little or no effect on self-reported speeding. The findings suggest that individuals are aware of the crash risks involved in speeding and aware of the possible negative outcomes from speeding enforcement but are influenced mainly by their perceptions and inherent traits, and somewhat influenced by enforcement activities.

Nevertheless, the common responses of most policy makers are to initiate tougher penalties for speeding and employ fear based advertising campaign that usually depicts graphical and bloody crash scenes. It would be more beneficial instead to allocate more resources to enforcement activities and refocus the advertising campaign to reinforce these activities.

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